In the Claims:

1. (Original) A method for computer aided processing of dual or multiple energy images, the method comprising:

employing a data source, the data source including a dual or multiple energy image set including a high energy image, a low energy image, a bone image, and a soft tissue image;

defining a region of interest within an image from the dual or multiple energy image set;

extracting feature measures from the region of interest; and,

reporting at least one of the feature measures on the region of interest.

2. (Original) The method of claim 1 further comprising acquiring the image set using projection X-ray radiographic imaging.

3. (Original) The method of claim 1 further comprising acquiring the image set using x-ray computed tomography.

4. (Original) The method of claim 1 further comprising acquiring the image set using digital x-ray tomosynthesis.

5. (Original) The method of claim 1 further comprising employing a feature selection algorithm on the region of interest and classifying the region of interest.

6. (Original) The method of claim 5 further comprising incorporating prior knowledge from training for classifying the region of interest.

7. (Original) The method of claim 6 wherein incorporating prior knowledge from training includes computing features on known samples of different normal and pathological medical conditions.

8. (Original) The method of claim 7 wherein the feature selection algorithm sorts through features of the known samples, selects useful features of the known samples, and discards features of the known samples which do not provide useful information.

9. (Original) The method of claim 7 wherein different classification groups are identified for sorting the feature measures, and further wherein the feature selection algorithm comprises determining a feature measure's ability to classify the region of interest into a classification group.

10. (Original) The method of claim 9 wherein the feature selection algorithm further comprises ranking each feature measure based on each feature measure's ability to classify the region of interest into a classification group.

11. (Original) The method of claim 10 wherein the feature selection algorithm further comprises reducing quantity of feature measures by eliminating correlated features.

12. (Original) The method of claim 10 wherein the feature selection algorithm further comprises selecting a highest ranked feature measure and adding additional feature measures in descending order.

13. (Original) The method of claim 5 wherein classifying the region of interest comprises classifying one or more medical conditions.

14. (Original) The method of claim 5 wherein the data source further includes at least one of image acquisition system information and demographic information, symptoms, and history of patient, wherein the image acquisition system information, _demographic information, symptoms, and history of patient serve as feature measures in the feature selection algorithm.

15. (Original) The method of claim 1 further comprising detecting and diagnosing at least one medical condition.

16. (Original) The method of claim 1 wherein defining a region of interest comprises manually selecting a region of interest.

17. (Original) The method of claim 1 wherein defining a region of interest comprises utilizing an automated algorithm.

18. (Original) The method of claim 17 wherein utilizing an automated algorithm includes inputting user specifications.

19. (Original) The method of claim 1 comprising defining regions of interest and incorporating features from all regions of interest on all images.

20. (Original) The method of claim 1 comprising defining at least one region of interest, employing a feature extraction algorithm, and classifying a candidate region of interest on each image and subsequently combining results of all operations.

21. (Original) The method of claim 1 wherein reporting at least one of the feature measures comprises using a marker on a display of each image within the dual or multiple energy image set where the at least one feature measure is located.

22. (Original) The method of claim 21 further comprising displaying a single image which incorporates all markers from each image within the dual or multiple energy image set.

23. (Original) A system for computer aided processing of dual energy images, the system comprising:

a detector generating a first image representative of photons at a first energy level passing through a structure and a second image representative of photons at a second energy level passing through the structure;

a memory coupled to the detector, the memory storing the first image and the second image;

a processing circuit coupled to the memory, the processing circuit processing a dual energy image set including a first decomposed image, a second decomposed image, a high energy image, and a low energy image from the first image and the second image, storing the dual energy image set in the memory as a data source, defining a region of interest within an image from the dual energy image set, and extracting feature measures from the region of interest; and,

a reporting device coupled to the processing circuit, the reporting device reporting at least one of the feature measures.

24. (Original) The system of claim 23 wherein the system is an projection X-ray radiographic imaging system.

25. (Original) The system of claim 23 wherein the system is a x-ray computed tomography system, and further wherein the detector generates a plurality of first images and a plurality of second images taken of the structure at different angles.

26. (Original) The system of claim 25 wherein processing a dual energy image set includes a plurality of high energy images and a plurality of low energy images.

27. (Original) The system of claim 23 wherein the system is a digital x-ray tomosynthesis system, and further wherein the detector generates a plurality of first images and a plurality of second images taken of the structure at different angles.

28. (Original) A system for computer aided processing of dual energy images, the system comprising:

detection means for generating a first image representative of photons at a first energy level passing through a structure and a second image representative of photons at a second energy level passing through the structure;

storage means for storing the first image and the second image;

processing means for processing a dual energy image set including a first decomposed image, a second decomposed image, a high energy image, and a low energy image from the first image and the second image, storing the dual energy image set in the memory as a data source, defining a region of interest within an image from the dual energy image set, extracting feature measures from the region of interest, employing a feature selection algorithm on the set of feature measures and identifying an optimal set of features, classifying the optimal set of features, and incorporating prior knowledge from training into classifying the optimal set of features; and,

display means for displaying the classified optimal set of features.

29. (Original) The system of claim 28 wherein the system is an projection X-ray radiographic imaging system.

30. (Original) The system of claim 28 wherein the system is a x-ray computed tomography system, and further wherein the detector generates a plurality of first images and a plurality of second images taken of the structure at different angles.

31. (Original) The system of claim 30 wherein processing a dual energy image set includes a plurality of high energy images and a plurality of low energy images.

32. (Original) The system of claim 28 wherein the system is a digital x-ray tomosynthesis system, and further wherein the detector generates a plurality of first images and a plurality of second images taken of the structure at different angles.

33. (Original) A storage medium encoded with a machine readable computer program code, said code including instructions for causing a computer to implement a method for aiding in processing of dual or multiple energy images, the method comprising:

employing a data source, the data source including a dual or multiple energy image set having a first decomposed image, a second decomposed image, a high energy image, and a low energy image;

defining a region of interest within an image from the dual or multiple energy image set;

extracting feature measures from the region of interest; and,

employing a feature selection algorithm on the feature measures for identifying an optimal set of features.

34. (Original) A method for detecting bone fractures, erosions, calcifications or metastases, the method comprising:

utilizing a bone image from a dual or multiple energy image set;

selecting a region of interest within the bone image to search for a calcification, fracture or metastatic bone lesion;

segmenting bone from a background of the bone image; and,

identifying a candidate region within the bone as a candidate for a calcification, fracture, erosion, or metastatic bone lesion.

35. (Original) The method of claim 34 further comprising classifying an identified candidate region.

36. (Original) The method of claim 35 wherein classifying an identified candidate region comprises using a computer aided rule based approach, wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases.

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37. (Original) The method of claim 36 wherein rules are based on size measurements of line edges of the identified candidate region.

38. (Original) The method of claim 34 wherein segmenting bone comprises utilizing a region growing algorithm.

39. (Original) The method of claim 38 wherein the region growing algorithm is manually initialized by having a user select a seed point.

40. (Original) The method of claim 38 wherein the region growing algorithm is automatically initialized by utilizing bone attributes to select a seed point.

41. (Original) The method of claim 34 wherein segmenting bone comprises multi-level intensity thresholding.

42. (Original) The method of claim 34 wherein identifying a candidate region comprises utilizing an edge detection algorithm.

43. (Original) The method of claim 42 wherein image processing using morphological erosion is used for eliminating noise and false edges.

44. (Original) The method of claim 42 wherein rib edges are eliminated using a connectivity algorithm.

45. (Original) The method of claim 34 further comprising indicating the candidate region on a display.

46. (Original) The method of claim 45 wherein indicating the candidate region comprises placing a marker on the bone image indicative of a classification of the candidate region.

47. (Original) A method for detecting lung disease, the method comprising:

utilizing a soft-tissue image from a dual or multiple energy image set;

selecting a region of interest within the soft-tissue image to search for an indication of disease;

segmenting the region of interest from a background of the soft-tissue image;

identifying a candidate region within a bone image which correlates to the region of interest in the soft-tissue image;

extracting features from the candidate region in the bone image; and,

classifying the region of interest in the soft-tissue image as a candidate for soft-tissue disease utilizing the features extracted from the bone image.

48. (Original) The method of claim 47, further comprising identifying a solitary pulmonary nodule or lesion, and wherein if the features extracted from the bone-image are indicative of calcification of the nodule, then the method further comprising utilizing the bone-image calcification features to classify the region of interest in the soft-tissue image as indicatively benign.

49. (Original) The method of claim 47 wherein classifying comprises using a computer aided rule based approach, wherein different rules apply for different medical conditions, and different rules are used for the soft-tissue and bone-images.

50. (Original) The method of claim 47 further comprising reporting at least one of the features using a marker on a display of each image within the dual or multiple energy image set where the at least one feature is located and displaying a single image which incorporates all markers from each image within the dual or multiple energy image set.

51. (Original) The method of claim 50 further comprising displaying a single image which incorporates markers uniquely indicative of results from the soft-tissue image that have been further classified based on results from the bone-image.

52. (Currently Amended) A method for computer aided processing of computed tomography images, the method comprising:

acquiring an image set of ~~dual-energy~~ computed tomography images;

employing a data source, the data source including the image set;

defining a region of interest within an image from the image set;

extracting feature measures from the region of interest; and,

reporting at least one of the feature measures on the region of interest.

53. (Original) A method for computer aided processing of volumetric computed tomography images, the method comprising:

acquiring an image set of volumetric computed tomography images;

employing a data source, the data source including the image set;

defining a region of interest within an image from the image set;

extracting feature measures from the region of interest; and,

reporting at least one of the feature measures on the region of interest.

54. (Original) The method of claim 53 wherein acquiring an image set comprises acquiring first energy images at a first energy, acquiring second energy images at a second energy, different than the first energy, and processing first decomposed images and second decomposed images, the first energy images, second energy images, first decomposed images, and second decomposed images forming the image set.

55. (Original) A method for computer aided processing of x-ray tomosynthesis images, the method comprising:

acquiring an image set of tomosynthesis images;

employing a data source, the data source including the image set;

defining a region of interest within an image from the image set;

extracting feature measures from the region of interest; and,

reporting at least one of the feature measures on the region of interest.

56. (Original) The method of claim 55 wherein acquiring an image set comprises acquiring first energy images at a first energy, acquiring second energy images at a second energy, different than the first energy, and processing first decomposed images and second decomposed images, the first energy images, second energy images, first decomposed images, and second decomposed images forming the image set.

57. (New) The method of claim 52 wherein acquiring an image set of computed tomography images comprises acquiring an image set of dual energy computed tomography images.